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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/028,690 | 12/28/2001 | Stephen V. Lunzman | 8350.0687-00 | 4786 |

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Finnegan, Henderson, Farabow,
Garrett & Dunner, L.L.P.
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Washington, DC 20005-3315

EXAMINER

LOPEZ, FRANK D

ART UNIT PAPER NUMBER

3745

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,690

Applicant(s)

LUNZMAN ET AL.

Examiner

F. Daniel Lopez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on December 28, 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

Applicant's arguments filed January 28, 2005, have been fully considered but they are not deemed to be persuasive.

Applicant argues that the difference between the suggested amendment to overcome the 112 rejection and applicant's claim, is "providing an adjustable gain to a difference between the estimated flow rate and the desired flow rate". Applicant is mistaken. The **difference concerns how the command signal is generated**. In applicant's claims, a generated value is a combination of an adjustable gain and a difference between estimated and desired flow rates, but generates a command signal that uses the adjustable gain, and the estimated and desired flow rates, not the generated value. This is confusing, since there is no indication of what the generated value is used for, and indicates that there is a different value used to generate the command signal. The suggested changes to the claims eliminates this confusion, by either generating the command value based on the generated value (i.e. the modified difference) or by eliminating the generated value.

Applicant argues that the area gain (W) shown in fig 5 of Aardema et al is constant and not adjustable. Applicant is confused. The 103 rejection uses the disclosure of Aardema et al which is a modification of the embodiment shown in the drawings. Aardema et al clearly indicates that the embodiment shown in the drawings are open looped, but that closed loop control over flow can be used in place of the open loop (column 6 line 56-60). This embodiment, using a closed loop control over flow is what is being modified by the adjustable gain.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the adjustable gain

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must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. This can be done by labeling box 60.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

Claims 1-20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 line 7-10 "providing an adjustable gain to a difference between the estimated flow rate and the desired flow rate; and computing a command signal to activate the valve based on the adjustable gain, the desired flow rate and the estimated flow rate" is confusing. Claim 10 line 9-11 and claim 20 line 13-15 have similar limitations and are similarly confusing. The specification clearly shows that a difference between a desired flow rate (Q_{cmd}) and the estimated flow rate (Q_{est}) is generated (at 76) and that this difference is modified by an adjustable gain (in box 60), with a command signal generated from the modified difference. This is not clear from the limitation. Suggest that the limitation be modified to be --modifying a difference between

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the estimated flow rate and the desired flow rate, using an adjustable gain; and computing a command signal to activate the valve based on the modified difference--; or --providing an adjustable gain; and computing a command signal to activate the valve based on the adjustable gain, the desired flow rate and the estimated flow rate

Claims not specifically mentioned are indefinite, since they depend from one of the above claims.

Claim Rejections - 35 USC § 103

Claims 1-20 are rejected under 35 U.S.C. § 103 as being unpatentable over Aardema et al (either one). Aardema et al discloses a system for controlling a flow through a valve and method of operating comprising pressure sensors (e.g. 305) monitoring a pressure drop (from 330) across the valve and a flow controller configured to determine a command signal (from 340) using a closed loop control over the flow (e.g. column 6 line 60-64), based on a desired flow rate (from 310) and estimated flow rate, based on the pressure drop and displacement of the valve (see discussion below); but does not disclose that the command signal is determined based on an adjustable gain, in addition to the desired and estimated flow rates; that pressure signals from the pressure sensors are subjected to a noise filter; or that the displacement of the valve is either measured by a valve position sensor or estimated based on a commands signal.

. Since a closed loop feedback generates a command signal based on a difference between an actual value and a desired value, and since a flow through a control valve is dependent on a pressure difference across and opening of the control valve; one of ordinary skill in the hydraulic control system art would recognize that the closed loop control over the flow would generate an estimated flow based on the pressure difference across and opening of the control valve, and the command signal based on the estimated flow and an actual flow, generated from a desired flow rate. If not, it would have been obvious at the time the invention was made to one having ordinary skill in the art to do so.

Official notice is taken that it is well known to modify a difference in a closed loop system, using an adjustable gain (i.e. either a PI circuit or a PID circuit), to determine a command signal, for the purpose of providing improved feedback accuracy. It would have been obvious at the time the invention was made to one having ordinary skill in the art to modify the difference in the closed loop system of Aardema et al, using an adjustable gain (i.e. either a PI circuit or a PID circuit), to determine a command signal, for the purpose of providing improved feedback accuracy.

Official notice is taken that it is well known to use a noise filter, to filter out higher frequency noise from the pressure signals. It would have been obvious at the time the invention was made to one having ordinary skill in the art to use a noise filter, to filter out higher frequency noise from the pressure signals of Aardema et al.

Official notice is taken that it is well known to determine a displacement of a valve by either measuring using a valve position sensor or estimating based on a previous command signal. It would have been obvious at the time the invention was made to one having ordinary skill in the art to determine a displacement of the valve of Aardema et al by either measuring using a valve position sensor or estimated based on a previous command signal.

Conclusion

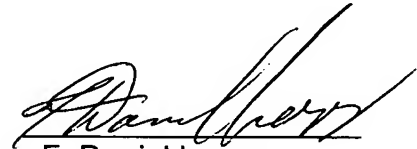
THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is (571)-272-4821. The examiner can normally be reached on Monday-Thursday from 6:15 AM -3:45 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is (703) 872-9306. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.

A handwritten signature in black ink, appearing to read 'F. Daniel Lopez', is written over a horizontal line.

F. Daniel Lopez
Primary Examiner
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April 18, 2005